Photonics holds promise for job creation

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In Melbourne's industrial heartland, there are six engineers at one small company who don't worry about losing their jobs.

They design and build devices that convert electrical signals into light pulses for transmission along fiber optic cables. A strand of fiber optic cable, no thicker than fishing line, can carry more than 100,000 of these data streams for dozens of miles.

With America's insatiable appetite for Internet bandwidth to send video, text and phone messages, the six engineers of Triple Play Communications on East Drive own a stake in the future.

That future, many believe, will in some way touch on photonics, the industry centered on putting light to work, whether carrying data through a fiber optic cable, cutting metal and circuits with a laser, or displaying information.

"It is no understatement when we say, 'As electronics was the technology of the 20th century, photonics is the technology of the 21st,' " said Jim Pearson, executive director of the Florida Photonics Cluster at the University of Central Florida.

Companies like Triple Play Communications and more than 30 other businesses in Brevard that work in photonics will help lead the economic recovery here, a resuscitation necessitated by the loss of thousands of space industry jobs as the shuttle program winds down next year.

The Brevard companies and more than 240 others across the state comprise the Florida Photonics Cluster. They directly and indirectly employ 27,000 people, mostly along the I-4 technology corridor, and have an impact on the statewide economy of more than $3 billion.

Congresswoman Suzanne Kosmas is among those who see the potential for the industry. She recently sponsored and passed an amendment in the House to include photonics businesses in the Small Business Financing and Investment Act.

The bill, which is expected to pass the U.S. Senate, could bring millions of dollars in grants and loans to the photonics industry, which she says has a "rich history" in Central Florida.

"Photonics and its ability to grow and expand is like many of the other incubator industries that we're able to have," Kosmas said in an interview. "They're all industries that have unlimited growth potential because of the relation to science. They have the potential to take off."

Two-decade effort

In the mid-1980s, a group of state lawmakers and researchers looked at several areas to invest in, and photonics stood out as a field destined for growth. That led to the 1986 establishment of the Center for Electro-Optics and Lasers at the University of Central Florida, later renamed the Center for Research and Education in Optics and Lasers, or CREOL.

Dozens of companies established a Florida branch to be near the college and to draw on the expertise of its faculty and graduate students. UCF expanded its programs in 1999, forming a separate school of optics, which became CREOL. Today, 51 research faculty members generate more than $20 million annually in research that supports businesses in the Florida Photonics Cluster.

Major photonics markets include biomedical, communications, aerospace, defense, homeland security, spectroscopy, microelectronics, photography and manufacturing.

"It is still a rapidly growing field, and our competition from other regions and countries is strong and active," Pearson said.

Pearson, a former president and general manager of a company called United Technologies Optical Systems, said Florida lawmakers needs to be much more proactive in supporting photonics. That support likely would mean more research money and special tax breaks for high-tech companies involved in photonics.

Other states are capitalizing on the industry.

Photonics plays a lead role in cutting-edge research and business growth in Arizona, California, Colorado and New York.

"There is some level of optics and photonics activity in almost every state in the USA, as well as in many other countries," Pearson said.

A growing need

It's not hard to see why photonics-related industry is growing.

The cell phone in your pocket? The computer on your desk? Your LCD television? All contain components made with photonics technology.

Light beams can be focused into military weapons or cutting tools.

Among the most explosive photonics-fueled areas is the transmission of an increasing volume of video, data and communication signals over fiber optic cables, which carry the information more efficiently that wire channeling electric impulses.

And with society's ever greater dependence on information and data, that capacity will be crucial.

That's where companies like Melbourne's Triple Play Communications come in.

"Our niche is high data rate," said President Keith Riffee.

Riffee said the federal grant and loan program sponsored by Kosmas might help his company if it needs an infusion of capital to meet a large order as the economy improves. The photonics cluster also helps help companies keep up to date with their colleagues.

"You're communicating with people in similar industries, so I believe your can share lessons learned, share elements of technology such as new components new processes," Riffee said. "And it's a networking opportunity."

In Brevard County, some companies in the photonics field report that business is coming back, despite the general sluggishness of the economy.

"We're not seeing things drop anymore," said Warren Seale, product manager at Gooch & Housego's Melbourne plant on Opportunity Drive. "We are beginning to see some increases."

The company produces devices that control laser beam intensity, position and other aspects.

"It allows you to electronically control the light," Seale said.

The product laser controller has a dozen or more common applications, including the manufacture of solar arrays, LCDs and Defense Department lasers. The company was started in 1982 by six engineers and now has nearly 40 employees. Its future looks secure.

"Products improvement is what we're focussed on," Seale said. "Where new things occur is in applications."

While most photonics companies are small, electronics giant Harris Corp., based in Melbourne, has an interest in recruiting engineers and technicians with expertise in the field. Harris belongs to the Florida Photonics Cluster and monitors precision optics education programs offered through Valencia and Indian River community colleges.

Harris will have jobs in the photonics field.

"We've used photonics folks for awhile," Jennifer Ogburn, Harris manufacturing engineering manager, said. "Part of the relationship we wanted with this Florida Photonics Cluster was finding folks who have these abilities and these skills. It's more that we are trying to plan for the future."

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At the Economic Development Commission of Florida's Space Coast, photonics technology looms large on the radar screen for creating jobs and luring research money, Lynda Weatherman, the organization's president and chief executive officer, said.

"For instance, the unmanned aerial vehicle (a class that includes the Predator drone) has a photonic solar array on it," Weatherman said, adding that technology unheard of a decade ago is now being used across many industries, including aviation, radiation, retail, defense and homeland security.

"This exposes us to both the aviation and electronics cluster and provides the opportunity to market Brevard's strength to multiple industries simultaneously," Weatherman said. "Although photonics isn't an entirely new industry, many of its uses are."